

**ATTACHMENT 1**  
**(Light Dissipation)**

Ser. No. 10/057,918  
Examiner U. Anyaso  
Group Art Unit 2675

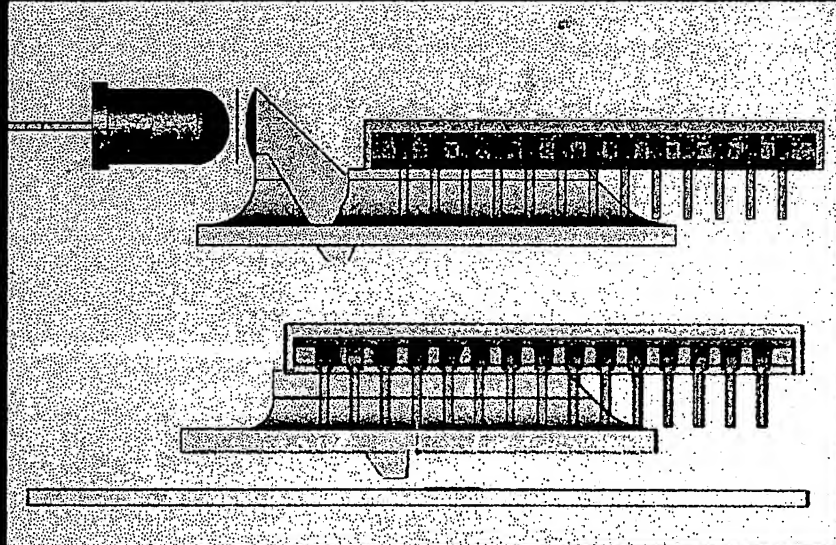
Attachment 1.

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## Package -- Live Demo

The package is a live demo of a package that is used to demonstrate the package's ability to dissipate heat. The package is a live demo of a package that is used to demonstrate the package's ability to dissipate heat.

Gen. 1



Gen. 2

Figure 1: Package (Gen. 1)

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# Illumination System

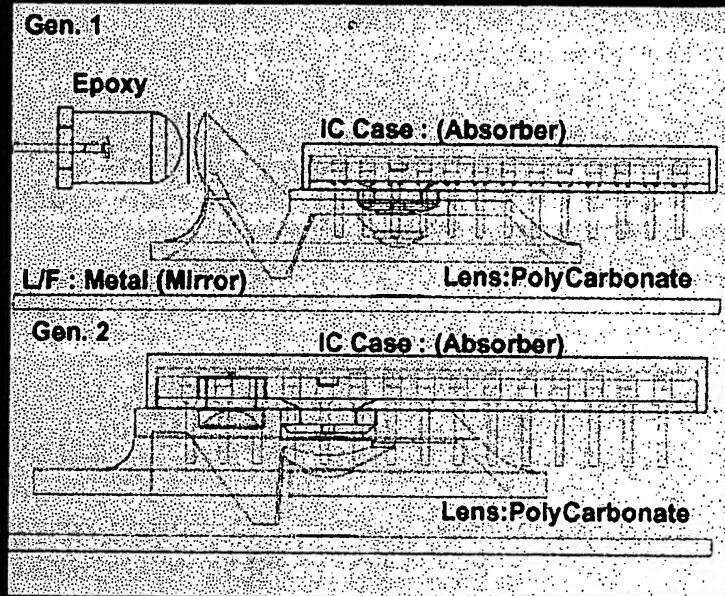
## TracePro Parameters Setting

LED chip power

=1 W

Ray number

=1,000,000 ray



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# Illumination System

## Stray Light - TracePro

Gen. 1

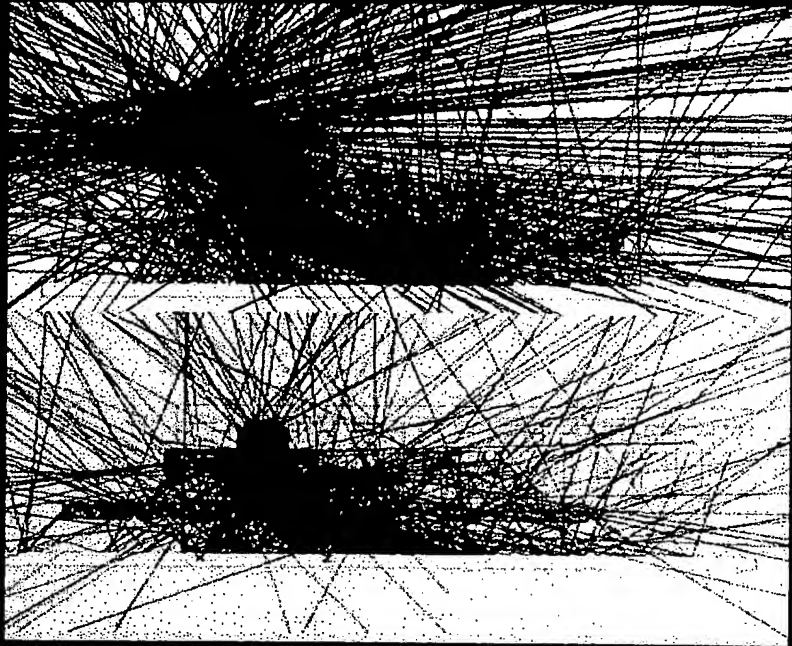
Gen.1

First Lens	40.10%
Illuminated Spot	17.05%

Gen. 2

Gen.2

First Lens	96.90%
Illuminated Spot	40.22%



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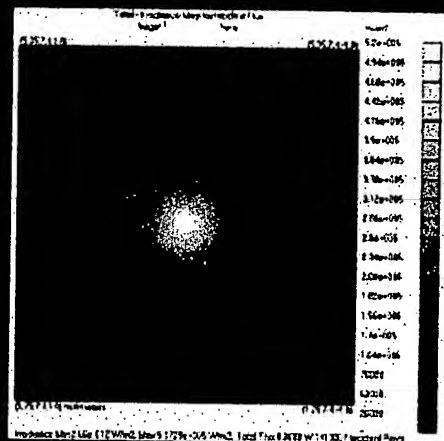
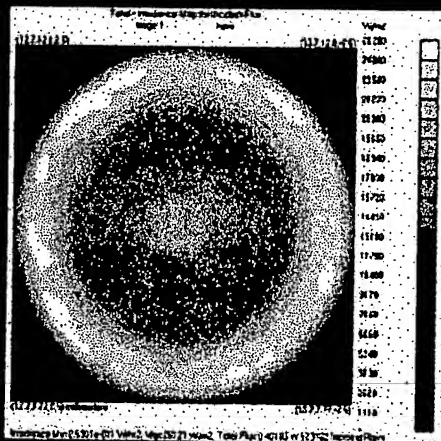
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# Illumination System

## First Lens - TracePro

Gen. 1 40.10% of Total Power

Gen. 2 96.9% of Total Power



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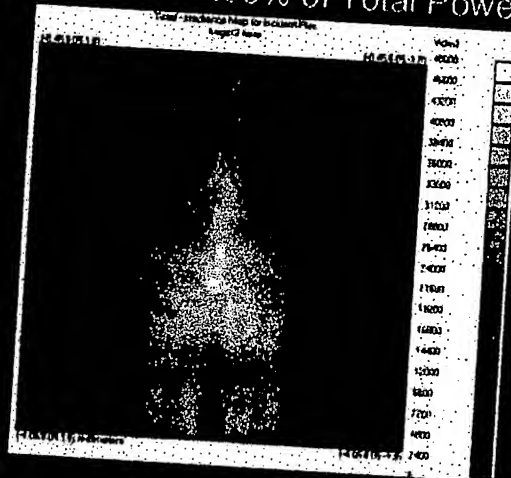
Attachment 1.

# Illumination System

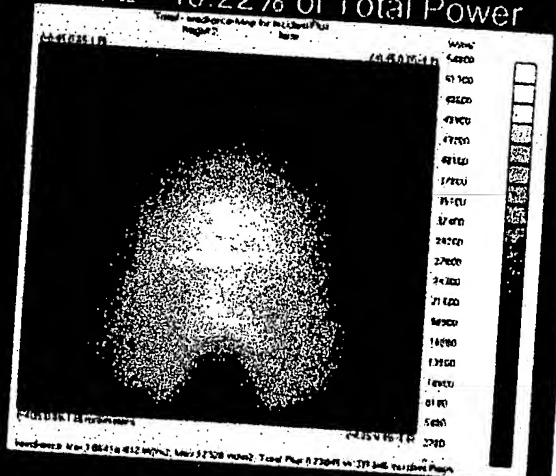
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## Illuminated Spot - TracePro

Gen. 1 17.05% of Total Power



Gen. 2 40.22% of Total Power



# ATTACHMENT 2 (Power Dissipation)

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Attachment 2.

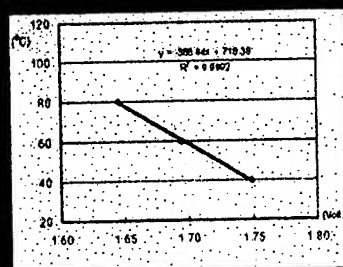
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## Power Dissipation (Rin)

graph of the power dissipation and resistance  
of the device for the different values of  
the input voltage.

### A. Generation 2

Temp (°C)	$V_i @ I_i = 100\mu A$
30	
40	1.749
60	1.695
80	1.646
100	



$$T = T_{a0} + P_{d0} \times R_i$$

$$P_{d0} = I_i \times V_i$$

# ATTACHMENT 2 (Power Dissipation)

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## Power Dissipation (Rin)

Power Dissipation (Rin) is the power dissipated by the device during operation. It is calculated as follows:

### A. Generation 2

Heating $I_f$ (mA)	$V_f$ (V)	$T_a$ (°C)	$I_f$	$P_d$	$R_{th}$
100	2.1	25	100	2.1	180
200	2.1	25	200	4.2	180

### B. 5mm LED (Traditional)

Heating $I_f$ (mA)	$V_f$ (V)	$T_a$ (°C)	$I_f$	$P_d$	$R_{th}$
100	2.1	25	100	2.1	50
200	2.1	25	200	4.2	50

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## LED Power Dissipation ( $R_{th}$ )

	Gen.1 (5mm LED)	Gen.2
Thermal Resistance	591	186

Lower  $R_{th}$       Lower Power Dissipation      Higher LED Reliability



## ATTACHMENT 2 (Power Dissipation)

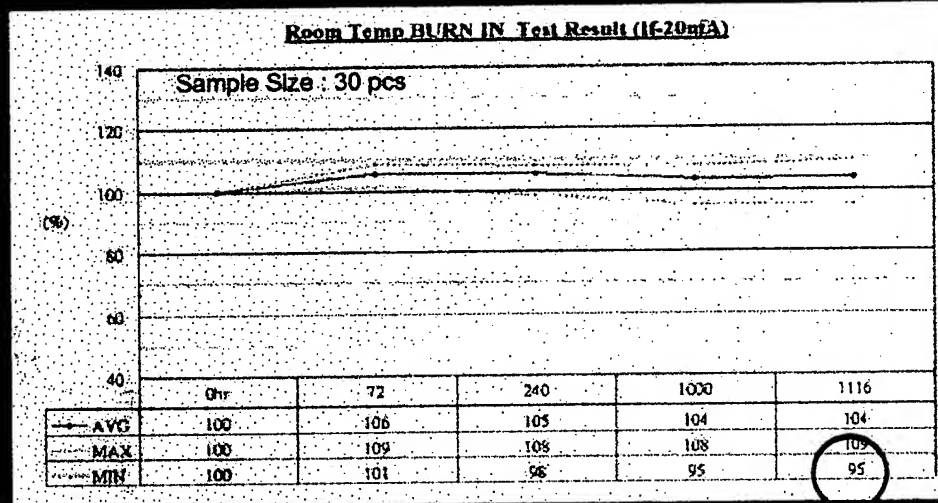
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### LED Burn-In (Life test)

#### Generation. 2 LED Burn-In(TS)



5 mm LED(TS) Degradation : 10~15 % (at 1K hrs)

**ATTACHMENT 3**  
**(Summary)**

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## Summary -- Why G2 ?

### Benefits of integrated solution

Features	Gen.1	Gen.2
Parts	more	few
LED Bending	Needed	No Needed
LED Assembly	Needed	No Needed
Clip Assembly	Needed	No Needed
LED Alignment	Required	None
LED Reliability	High	Higher